

Translation

PATENT COOPERATION TREATY

PCT/JP2004/005902



PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 04-F-016PCT	FOR FURTHER ACTION See Form PCT/IPEA/416	
International application No. PCT/JP2004/005902	International filing date (day/month/year) 23 April 2004 (23.04.2004)	Priority date (day/month/year) 24 April 2003 (24.04.2003)
International Patent Classification (IPC) or national classification and IPC C23C 14/08, 14/34		
Applicant NATIONAL INSTITUTE FOR MATERIALS SCIENCE		

1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 4 sheets, including this cover sheet.

3. This report is also accompanied by ANNEXES, comprising:

a. ☒ (sent to the applicant and to the International Bureau) a total of 1 sheets, as follows:

☒ sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).

☐ sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.

b. ☐ (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) _____, containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).

4. This report contains indications relating to the following items:

☒ Box No. I Basis of the report

☐ Box No. II Priority

☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

☐ Box No. IV Lack of unity of invention

☒ Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

☐ Box No. VI Certain documents cited

☐ Box No. VII Certain defects in the international application

☒ Box No. VIII Certain observations on the international application

Date of submission of the demand 01 October 2004 (01.10.2004)	Date of completion of this report 01 March 2005 (01.03.2005)
Name and mailing address of the IPEA/JP	Authorized officer
Facsimile No.	Telephone No.

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP2004/005902

Box No. I Basis of the report

1. With regard to the language, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.

- ☐ This report is based on translations from the original language into the following language _____, which is language of a translation furnished for the purpose of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)

2. With regard to the elements of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

- ☐ The international application as originally filed/furnished
- ☒ the description:
- pages _____ 1-7 _____, as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☒ the claims:
- pages _____ 5, 6, 8 _____, as originally filed/furnished
- pages* _____, as amended (together with any statement) under Article 19
- pages* _____ 1, 3, 7 _____ received by this Authority on 01 October 2004 (01.10.2004)
- pages* _____ received by this Authority on _____
- ☒ the drawings:
- pages _____ 1-5 _____, as originally filed/furnished
- pages* _____ received by this Authority on _____
- pages* _____ received by this Authority on _____
- ☐ a sequence listing and/or any related table(s) – see Supplemental Box Relating to Sequence Listing.

3. ☒ The amendments have resulted in the cancellation of:

- ☐ the description, pages _____
- ☒ the claims, Nos. _____ 2, 4 _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages _____
- ☐ the claims, Nos. _____
- ☐ the drawings, sheets/figs _____
- ☐ the sequence listing (*specify*): _____
- ☐ any table(s) related to sequence listing (*specify*): _____

* If item 4 applies, some or all of those sheets may be marked "superseded."

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

International application No.

PCT/JP04/005902

Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)

Claims

1, 3, 5-8

YES

Claims

NO

Inventive step (IS)

Claims

1, 3, 5-8

YES

Claims

NO

Industrial applicability (IA)

Claims

1, 3, 5-8

YES

Claims

NO

2. Citations and explanations (Rule 70.7)

Document 1: JP, 2003-119578, A (Independent Administrative Institution National Institute for Materials Science), 23 April, 2003 (23.04.03)

Document 2: Friction and Wear Properties of Partially Stabilized Zirconia with Solid Lubricant, (Y. Wang, et al.), Wear, 1993, Vol. 167, No. 1, pages 23-31

Document 3: Control of Frictional Force on Coating Films of Boron Nitride-Copper Complex in Ultra High Vacuum, (Masahiro Goto, et al.), Thin Solid Films, 2002, Vol. 405, pages 300-303

Document 4: Characteristics of Thin Films of Hexagonal Boron Nitride Mixed with Copper Controlled by a Magnetron Co-Sputtering Deposition Technique, (Masahiro Goto, et al.), Applied Surface Science, 2002, Vol. 185, pages 172-176

Claims 1, 3 and 5-8

The subject matters of claims 1, 3 and 5-8 are not disclosed in any of the documents cited in the ISR, and appear to be novel and to involve an inventive step. Particularly the feature of a copper oxide thin film material with low friction having a coefficient of friction of 0.06 or less is not described in any of the documents.

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

The specification of the present application explains on page 4 a method for manufacturing an invented copper oxide thin film material with low friction, describing that the level of vacuum in forming film is set at " 1×10^{-4} Pa – 1×10^{-6} Pa" and that "the operation conditions such as RF power, the distance between a substrate and a target, and the strength of a substrate can be specified as required for the plasma film-forming of copper oxide thin film mainly having CuO." Examples of the present application describe that, by means of sputtering with CuO target, copper oxide thin film having crystal orientation and a coefficient of friction of 0.06 or less could be produced on the condition that the level of vacuum is 1×10^{-6} Pa and the oxygen concentration level is 0 to 35%.

On the other hand, document 1 (JP, 2003-119578, A) by the same applicant explains that copper oxide thin film was produced in case of an oxygen concentration of 0% by means of the same method as the invention of the present application. Document 1 does not specify the level of vacuum in forming film, but the level of vacuum in the forming of film by sputtering is generally set at about 1×10^{-4} Pa – 1×10^{-6} Pa.

Comparing the invented manufacturing method for copper oxide thin film of the present application with the manufacturing method for copper oxide thin film described in document 1, both methods have no particular differences from each other, but the obtained copper oxide thin film in document 1 does not have crystal orientation, and has a coefficient of friction of 0.06 or more.

In view of the foregoing, the specification of the present application does not clarify under what special production conditions in comparison with document 1 copper oxide thin film having crystal orientation and a coefficient of friction of 0.06 or less could be first produced.